

ZEYU (JERRY) WEI

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EDUCATION

University of Washington - Seattle	09/2019-Present
Ph.D., Statistics	
Advisor: Yen-Chi Chen, Tyler H. McCormick	
University of Wisconsin – Madison	09/2015-05/2019
Major in Statistics (Honor), Math (Honor), Sociology (Concentration in Analysis and Research)	
Certificate in Computer Science	

RESEARCH INTERESTS

Machine Learning, Topological Data Analysis, Network Analysis, Nonparametric Statistics
Other Coursework: Data Visualization, Statistical and Probability Theory

TECHNICAL SKILLS

Proficient: Python, Spark, SQL, AWS, R
Familiar: Java, C++, Scala, MATLAB, Mathematica, Altair, Vega-Lite, Excel

HONORS & AWARDS

• Student & Early Career Travel Award by American Statistical Association	2022
• Graduate Student Conference Presentation Award by UW Graduate School	2022
• GPSS Travel Grant by UW Graduate & Professional Student Senate	2022
• R. Creighton Buck Scholarship	2019

PROFESSIONAL EXPERIENCE

Data Scientist Intern	06/2023-09/2023
Machine Learning and Optimization Team, Amazon DSP, <i>Amazon Ads</i>	
• Design online experiment framework to facilitate algorithm testing for Real Time Bidding	
• Create a bidding simulator based on data logs (10M+ a day) incorporating proxies to the main components in the real bidder.	
• Model the contentions between adlines and validate with simulations.	

RESEARCH EXPERIENCE

Graph-Assisted Methods for Machine Learning, Network Analysis, and Epidemic Modeling

<u>Graph Learning for Single-Cell RNA with Velocity</u>	03/2023-Present
Advisor: Yen-Chi Chen (UW Stats), Kevin Lin (UW Biostat)	
• Train graphical representations on high-dimensional scRNA-seq data (~20,000 genes) with inferred RNA velocity vectors.	
• Propose statistical measure on the uncertainties on the learnt representation.	
<u>Skeleton Regression: A Graph-Based Approach to Estimation on Manifold</u>	08/2021-Present
Advisor: Yen-Chi Chen	
• Invent a novel regression framework to deal with noisy multivariate data lying around low-dimensional manifold structures.	
• Extend nonparametric regression methods to inputs on graphs.	
• Develop Python and R package with applications to image data.	

Skeleton Clustering: Dimension-Free Density-Aided Clustering

12/2019-07/2022

- Propose a clustering framework on large-scale high-dimensional data with density-aided similarity measures that circumvent the curse of dimensionality.
- Learn data representation incorporating geometric information using graphs.
- Implement the [R package](#) and create [interactive visualizations](#) on astronomy data.

Epidemic Model Failures under Missingness

09/2021-Present

Advisors: Tyler McCormick (UW Stats & Sociology), Arun Chandrasekhar (Stanford Econ), Paul Goldsmith-Pinkham (Yale Management)

- Characterize failure conditions for epidemic model on contact networks with missingness.
- Simulate epidemic diffusion on networks with different geometric structures.

On the Translates of General Dyadic Systems on R

05/2018-07/2018

Advisors: Theresa C. Anderson (UW-Madison & Purdue Math)

- Generalize the mathematical notion of distinct dyadic system and prove classification criteria.

Financial and Healthcare Projects

The Effects of Noise Exposure and Aging on the Acoustic Reflex in Normal-Hearing People

PI: Ward R Drennan (UW Otolaryngology)

01/2020- 08/2020

- Apply Mixed Effects Models to identify indicators of subclinical hearing problems with experimental Audiology data.

Model Maxima Series with Autoregressive Conditional Fréchet Model

07/2018-05/2019

Advisor: Zhengjun Zhang (UW-Madison Stats)

- Model maximum stock prices by incorporating dynamic components into a generalized extreme value model with applications to stock returns and foreign exchange trading.

PUBLICATIONS

Journal Publications

- [1] **Wei, Z.**, Chen, Y. (2023) Skeleton Clustering: Dimension-Free Density-Aided Clustering, *Journal of the American Statistical Association* (Top Statistics journal)
- [2] **Wei, Z.**, Chen, Y. Skeleton Regression: A Graph-Based Approach to Estimation on Manifold (manuscript submitted to Journal of Machine Learning Research, top ML journal)
- [3] Anderson, T.C., Hu, B., Jiang, L., Olson, C., **Wei, Z.** On the translates of general dyadic systems on R. *Mathematische Annalen*. 377, 911–933 (2020). (Top Math journal)

Conferences

- [4] **Wei, Z.**, Chen, Y. Skeleton Regression: A Graph-Based Approach to Estimation with Manifold Structure, *Joint Statistical Meeting 2023*
- [5] **Wei, Z.**, Chen, Y. Skeleton Clustering: Graph-Based Approach for Dimension-Free Density-Aided Clustering, *NeurIPS 2022 Workshop, New Frontiers in Graph Learning*
- [6] **Wei, Z.**, Chen, Y. Noval Graph-Assisted Approach to Estimation on Manifold, *Symposium on Data Science & Statistics, 2022*
- [7] Drennan, W., Langley, L., **Wei, Z.** The Effects of Noise Exposure and Aging on the Acoustic Reflex in Normal-Hearing People, *182nd Meeting of the Acoustical Society of America, 2022*

SERVICES & VOLUNTEERS

- Organizer of the [Geometric Data Analysis Reading Group](#), UW Statistics 10/2021-Present
- Lead Tutor, coordinating tutoring center in UW Statistics department 09/2021-06/2023
- Teaching Assistant: Machine Learning, Stochastic Process, Mathematical Statistics 09/2019-Present